

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/012065

International filing date (day/month/year)
26.10.2004

Priority date (day/month/year)
27.10.2003

International Patent Classification (IPC) or both national classification and IPC
C12N11/04, C12N11/08, C12P13/02, C12P17/12

Applicant
LONZA AG

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/012065

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2004/012065

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11,13,16,17
	No: Claims	12,15
Inventive step (IS)	Yes: Claims	
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims,	

2. Citations and explanations

see separate sheet

Re Item V.

The following document is referred to in this communication:

- D1: SADA E ET AL: "PERFORMANCE OF AN ENZYME REACTOR UTILIZING A MAGNETIC FIELD" BIOTECHNOLOGY AND BIOENGINEERING, vol. 22, no. 1, 1980, pages 243-246
- D2: US-A-4 774 178 (EGERER ET AL) 27 September 1988 (1988-09-27)
- D3: WO 97/06248 A (ALLIED COLLOIDS LIMITED; ARMITAGE, YVONNE, CHRISTINE; HUGHES, JONATHAN) 20 February 1997 (1997-02-20)

Novelty (Art 33(2) PCT)

The subject matter of claims 1-11 is new because the prior art does not disclose a process for the preparation of polyacrylamide beads containing encapsulated cells where the suspension of cells with persulfate and acrylic monomers are mixed with an emulsion of an aqueous solution of a tertiary amine in a water-immiscible liquid.

The subject matter of claims 12 and 15 is not new because D3 discloses polyacrylamide beads containing encapsulated *Rhodococcus* cells containing a nitrilase, and the use of these beads for the transformation of a nitrile in an acid.

The subject matter of claim 17 is new.

Inventive step (Art 33(3) PCT)

The subject matter of claim 1 does not involve an inventive step because it is known from the prior art that the tertiary amine can be present in the water-immiscible liquid before the addition of the material to be immobilized with acrylic monomers and persulfate. For example D1 (see materials and methods section) discloses the preparation of polyacrylamide beads containing urease where the toluene-chloroform phase contains a surfactant and tetramethylethylenediamine. D2 discloses the preparation of

**WRITTEN OPINION OF THE
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AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/012065

Protaminobacter rubrum containing beads where a suspension of polymerizable acrylic resin, cells and persulfate is added dropwise to a stirred silicone oil containing tetramethylethylenediamine.

Claims 2-17 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step as the relevant subject matter is either disclosed in the cited prior art or falls within the knowledge and ability of the skilled person.

Further remarks

The claim numbering is not correct: there is no claim 14.